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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,933	03/16/2004	Akiyoshi Aoyagi	9319S-000670	2339
27572	7590	04/07/2006	EXAMINER	
HARNES, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			SANDVIK, BENJAMIN P	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 04/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/801,933		AOYAGI, AKIYOSHI	
	<b>Examiner</b>		<b>Art Unit</b>	
	Ben P. Sandvik		2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed on 3/31/2006 have been fully considered but they are not persuasive. The applicant argues that amended claims 1, 11, and 13 overcome the Nishimura reference with the added limitations that "a gap is created between the second carrier substrate and the first semiconductor chip, as in claims 1 and 13; and "a gap is created between a bottom surface of the second carrier substrate opposite the third semiconductor chip and a top surface of the first semiconductor chip". Figure 6 of Nishimura discloses a gap between the second carrier substrate (Fig. 6, 1a) and a top surface of the first semiconductor chip (Fig. 6, 3b), the gap being occupied by another chip and adhesive. This gap is a necessary feature of Nishimura as it allows for chip 3a to be disposed on the bottom side second carrier substrate 1a. Accordingly, arguments towards the rejection of claim 13 are not persuasive by similar reasoning.

The applicant's arguments towards claim 12 are being supported by reference to Figure 8 of Degani. However, the examiner points out that the rejection of claim 12 is being made in view of Figures 6 and 7, with parts of Figure 6 labeled as in Figure 5. Figure 6 discloses a gap between the third semiconductor chip and the first semiconductor chip.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2826

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-5, 8, 10, 11, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishimura et al (U.S. Patent #6781241).

With respect to **claims 1 and 13**, Nishimura teaches a first carrier substrate (Fig. 6, 1b); a first semiconductor chip mounted face down on the first carrier substrate (Fig. 6, 3b); a second semiconductor chip mounted face down on a reverse face of the first carrier substrate (Fig. 6, 3f); a second carrier substrate (Fig. 6, 1a); a third semiconductor chip mounted on the second carrier substrate (Fig. 6, 3c); and protruding electrodes connecting the second carrier substrate to the first carrier substrate so that the second carrier substrate is held above and spaced apart from the first semiconductor chip (Fig. 6, 7), such that a gap is created between the second carrier substrate and the first semiconductor chip (Fig. 6, gap between second carrier substrate and first semiconductor chip is occupied by another chip); wherein the third semiconductor chip comprises a structure in which a plurality of chips are stacked (Fig. 6, 3c and 3d).

With respect to **claim 3**, Nishimura teaches a sealant for sealing the third semiconductor chip (Fig. 6, 2).

With respect to **claim 4**, Nishimura teaches a sealant comprising molded resin (Col 7 Ln 29).

With respect to **claim 5**, Nishimura teaches that a position of a sidewall of the sealant coincides with a sidewall of the second carrier substrate (Fig. 6, 1a and 2).

With respect to **claim 8**, Nishimura teaches that the first carrier substrate comprises a flip-chip mounted ball grid array (Fig. 6, 8), and that the second carrier substrate comprises a mold-sealed ball grid array (Fig. 6, 9).

With respect to **claim 10**, Nishimura teaches that the third semiconductor chip comprises a structure in which a plurality of chips is arranged in parallel on the second carrier substrate (Fig. 6, 3c and 3d).

With respect to **claim 11**, Nishimura teaches a first carrier substrate (Fig. 6, 1b); a first semiconductor chip mounted face down on at least one face of the first carrier substrate (Fig. 6, 3b); a second carrier substrate (Fig. 6, 1a); a second semiconductor chip mounted on the second carrier substrate (Fig. 6, 3a); a third semiconductor chip mounted on a reverse face of the second carrier substrate (Fig. 6, 3c), and protruding electrodes bonding the second carrier substrate to the first carrier substrate (Fig. 6, 7); wherein a gap is created between a bottom surface of the second carrier substrate opposite the third semiconductor chip and a top surface of the first semiconductor chip such that the second carrier substrate is spaced apart from the first semiconductor chip (Fig. 6, gap between second carrier substrate and first semiconductor chip is occupied by another chip); wherein the third semiconductor chip comprises a structure in which a plurality of chips are stacked (Fig. 6, 3c and 3d).

Claim 12 is rejected under 35 U.S.C. 102(e) as being anticipated by Degani et al (U.S. PG Pub #20020079568).

With respect to **claim 12**, Degani teaches a carrier substrate (Fig. 6, 76), a first semiconductor chip mounted face down on the carrier substrate (Fig. 6, 75), a second semiconductor chip mounted face down on a reverse face of the carrier substrate (Fig. 6, 74), a third semiconductor chip (Fig. 6, chip is mounted on second substrate) on which re-arrangement wiring line layers are formed on surfaces where electrode pads are formed (Fig. 7, 91, 93, 94), and protruding electrodes connecting the third semiconductor chip to the carrier substrate so that the third semiconductor chip is held above and spaced apart from the first semiconductor chip (Fig. 7, 92), such that a gap is created between the third semiconductor chip and the first semiconductor chip.

### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben P. Sandvik whose telephone number is (571) 272-8446. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2826

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bps

  
EVAN PERT  
PRIMARY EXAMINER